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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/879,905	06/14/2001	Yasuhiro Shimada	35.C15451	5559

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EXAMINER

YAM, STEPHEN K

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/879,905	SHIMADA ET AL.	
	Examiner	Art Unit	
	Stephen Yam	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7 and 9-25 is/are pending in the application.
- 4a) Of the above claim(s) 10-16 and 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 9, 17-19 and 23-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

This action is in response to Amendments and remarks filed on October 2, 2003. Claims 1-5, 7, 9-25 are currently pending. Claims 10-16 and 20-22 have been withdrawn.

Election/Restrictions

1. Newly amended claims 10-16 and 20-22 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The originally presented invention did not describe the specific steps of producing a probe, including utilizing a second substrate having a recess portion, forming a layer to become a tip layer in the recess portion, aligning the first substrate and the second substrate such that the flower cover portion and the layer are in contact, detaching the second substrate from the first substrate to form a tip.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 10-16 and 20-22 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 23-25 are rejected under 35 U.S.C. 102(e) as being anticipated by Mitsuoka et al. US Patent No. 6,528,780.

Regarding Claims 1 and 23-25, Mitsuoka et al. teach (see Fig. 7) a probe for detecting near-field light or irradiating near-field light (see Col. 3, lines 53-65), comprising a cantilever (see Col. 9, lines 48-50) having first (right) and second (left) ends, being supported at said first end by a substrate (5) and having said second end free (see Fig. 7), a hollow tip (2) (extending from (13) at bottom-left) formed at said free end of said cantilever, said tip having an end (bottom), a microaperture (3) for utilizing near field light formed at said end of said tip (see Col. 9, lines 55-59), and a groove (13) formed inside said cantilever, said groove comprising a hollow waveguide (13) and a mirror (slanted bottom-right end of (13)), wherein said mirror reflects the light entering from the microaperture toward the hollow waveguide or reflects the light transmitted in said hollow waveguide toward said microaperture (see Fig. 7). Regarding Claim 23, Mitsuoka et al. teach the mirror as a slanted face (see Fig. 7). Regarding Claim 24, Mitsuoka et al. teach a light towards the microaperture reflected by the mirror generating near field light in the vicinity of the microaperture (see Col. 9, lines 50-59). Regarding Claim 25, Mitsuoka et al. teach a light toward the hollow waveguide reflected by the mirror as a propagating light passing through the microaperture (see Col. 9, lines 50-59).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-5, 7, 9, and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsuoka et al. in view of Quate US Patent No. 5,354,985.

Regarding Claims 2-4 and 17-19 (as dependent from Claims 2-4), Mitsuoka et al. teach the probe in Claim 1, according to the appropriate paragraph above. Regarding Claims 17-19 (as dependent from Claims 2-4), the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Mitsuoka et al. do not teach the waveguide containing a V-shaped transversal cross section, or a trapezoidal cross section, or a U-shaped transversal cross section. It is well known in the art to use different-shaped waveguide cross sections to direct light as desired. It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the waveguide with a V-shaped, trapezoidal, or U-shaped transversal cross section in the probe of Mitsuoka et al., to efficiently guide light while conforming to desired dimensional and space specifications.

Regarding Claims 5, 7, and 17-19 (as dependent from Claims 5 and 7), Mitsuoka et al. teach the probe in Claim 1, according to the appropriate paragraph above. Regarding Claims 17-19 as depending from Claims 5 and 7, the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Mitsuoka et al. do not teach the tip shaped as a square cone or the cantilever principally

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composed of silicon. Quate teaches the tip shaped as a square cone (see Fig. 6D) and the cantilever (see Fig. 1B) principally composed of silicon (see Col. 3, line 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use silicon for the cantilever and provide the tip as a square cone as taught by Quate in the probe of Mitsuoka et al., to utilize common materials to conserve manufacturing costs and to shape the optical beam for greater beam confinement and less optical loss through the cantilever.

Regarding Claim 9 and 17-19 (as dependent from Claim 9), Mitsuoka et al. teach the probe in Claim 1, according to the appropriate paragraph above. Mitsuoka et al. also teach (see Fig. 7) a lens (5) for collecting the incident light (see Col. 9, lines 55-59). Regarding Claims 17-19 as depending from Claim 9, the body of the claims does not specify any limitations further defining a "surface observation apparatus", an "exposure apparatus", or an "information processing apparatus", so therefore the definition in the preamble cannot be given any patentable weight. Mitsuoka does not teach the mirror as a concave mirror. Quate teaches (see Fig. 5C) a concave lens (56B) (see Col. 9, lines 8-17) in the waveguide (51) to converge the light rays on the tip of the cantilever. Mitsuoka and Quate do not teach the combination of the mirror and concave lens into a single concave mirror. It is well known in the art to provide curvature in a mirror for repositioning a beam of light for the same effect as a lens. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a concave lens as taught by Quate for the lens of Mitsuoka et al. and combine the lens and mirror into a concave mirror in the probe of Mitsuoka et al., to converge the light rays on the tip of the cantilever, as taught by Quate (see Col. 9, lines 8-170 for maximal light output, and since it has been held that

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forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893).

Response to Arguments

6. Applicant's arguments with respect to claims 1-5, 7, 9, 17-19, and 23-25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yee et al. US Patent No. 6,535,474, teach an optical near-field probe with cantilever, a waveguide, a mirror, a hollow tip, and an aperture, wherein the mirror reflects light transmitted in the waveguide towards the aperture.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

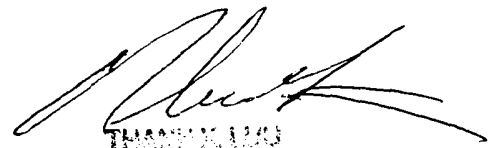
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Yam whose telephone number is (703)306-3441. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703)308-4852. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

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THOMAS J. LEE
ATTORNEY